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COUNTRY	East Germany	REPORT	[redacted]
SUBJECT	Development of Audio-Surveillance Equipment at Hohenschoenhausen	DATE DISTR.	21 December 1956
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		REQUIREMENT NO.	RD
DATE OF INFO. PLACE ACQUIRED	[redacted]	REFERENCES	

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1. The East German Ministry for State Security (Ministerium fuer Staatssicherheit - MfS) utilized the services of prisoners at the prison camp of the SSD in Hohenschoenhausen to design and modify monitoring devices for audio-surveillance. The prisoners engaged in this work were known as the High Frequency Group.

2. Although some prisoners claimed that Soviets had formerly visited the camp on frequent occasions, none were observed during the 1953-1956 period. The rumor that the camp was a "Russian Institute" appeared to be unfounded, even though 80 percent of the miniature amplifiers produced were allegedly for the Soviets.

3. From June 1953 to August 1956, the following devices of Western origin were delivered to the High Frequency Group:

[redacted]

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   c. Ten to 20 Webster wire recorders;

   d. Several hundred wire recorders [redacted] these had a playing time of one and one-half hours and were probably used to monitor telephone conversations;

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   e. [redacted] "transistorized" pocket receivers (type unknown);

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   f. Hearing aids manufactured [redacted]

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   g. Almost every type of recording device currently manufactured [redacted]

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These devices were delivered in an assembled state. As far as is known, they had not been altered by the SSD, with the possible exception of the hearing aids. Copies of the [redacted] publication [redacted] were also received. A prisoner was required to explain the purpose of the various articles and devices mentioned in the periodical and, on occasion, to translate the articles into German.

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STATE	#	x	ARMY	#	x	NAVY	#	x	AIR	#	x	FBI		AEC		OSI	#	x	[redacted]

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(Note: Washington distribution indicated by "X"; Field distribution by "#".)

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4. Miniature Transmitter

a. Prior to June 1953, Ernst Krause, formerly of Funkwerk Dresden, had completed the development of an ultra short-wave FM miniature transmitter with a frequency range of 70 to 80 megacycles and an effective range of 150 to 500 meters. The transmitter had been developed at the request of the Soviets [redacted] The High Frequency Group was in charge of assembling the devices; all construction components were of Western origin. Two types of transmitters were made: one line-powered which could operate as long as the mechanism was in order, and one battery-powered which could operate for approximately four days. 25X1

b. The line-powered transmitter had the following major components:

1 high frequency condenser microphone

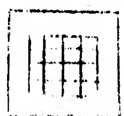
1 subminiature tube, exact type unknown

1 ultra short-wave coil

1 rectifier

1 line transformer, type M 42 (former general German designation)

The microphone, built by Krause, was probably designed initially by the Soviets as they had been working on a microphone at the prison at an earlier date. It was approximately the size of an American 25 cent coin and had a frequency range of 100 to 10,000 cycles. The microphone consisted of aluminum foil with a counterelectrode milled in the following design:



The amount of power consumed by the transmitter was so slight that it would not register on an ordinary Watt meter. These transmitters were allegedly to be built into the wall under switchboxes. They were cylindrical in shape with a diameter of approximately 100 millimeters and a length of approximately 150 millimeters. The sensitivity was allegedly so great that the transmitters could be affixed to the opposite side of the wall of the room to be monitored.

c. The battery-powered transformer had the same characteristics and construction elements as the line-powered type except that the line transformer and rectifier were replaced by a Pertrix anode battery of 30 V and a Pertrix filament of 1.5 V. Both batteries were of Western origin. The battery-powered transmitters were installed in cigarette packs, in large fountain pens, and in pencil cases. Krause is still working on this transmitter. He is attempting to use a 5 V battery and two transistors. In addition to Krause, three mechanics also worked on the transmitter. These were Fred Wieseke (formerly of Funkwerk Radeberg), Horst Hauffe, and Werner Dahlberg. Guenther Sobel, an engineer now at Bad Blankenburg/Harz, worked on the transmitter at one time and may know the complete drawing for the device. Sobel also built broadcast receivers, using Phillips transistors, and transmitter/receivers to be attached to a web-belt. The transmitter/receivers were allegedly for use of the infantry in intercommunications.

5. Receiving Units for Miniature Transmitter

a. The prison had two Rhode and Schwarz receivers which were probably used to pick up the miniature transmitter broadcasts. One had a frequency range from ultra short wave to medium wave; the second, from medium to long wave. The receivers were intended for concurrent operation.

b. Prior to 1953, the SSD staff had attempted to construct small receivers for the transmitter. Krause had worked on several of these but the designs

were not satisfactory. Finally, he took parts from a Rhode and Schwarz standard receiver and attempted to miniaturize the design for the 70 to 80 megacycle range. Krause's technical ability was doubtful and although he designed at least seven types of receivers and produced approximately 10 units of each type, even the seventh modification was unsatisfactory. This was used, however, as no other was available. Practically all necessary types of equipment were available for this research; almost all were of Rhode and Schwarz design.

6. <u>Monitoring Devices Evolved from Hearing Aids</u>

a. The first "transistorized" Beoton hearing aids arrived at the camp in March or April 1955. They came in two sizes: large with white cases, and small with black cases. Both types were equipped with four transistors. At first, the hearing aids were modified only by detaching the microphone and inserting a microphone cable between the microphone and the amplifier. The hearing aids were then installed directly as monitoring devices. Prior to 1953, Beoton devices using subminiature tubes instead of transistors had been treated similarly.

b. <u>Type I Device</u>

1) The original transistors in the hearing aids apparently were not powerful enough for the use intended by the SSD. Shortly after the hearing aids were received, work began on the designing of an improved monitoring device using other types of transistors. A device was designed from a circuit diagram, probably drawn on the basis of the Beoton devices by SSD officers in charge of the group. The prisoners believed that the SSD personnel carefully screened Western publications and used ideas found in them to modify the circuits of the devices. By June or July 1955, the basic design for the first device was completed. This was referred to as Type I by the prisoners, although this was probably not the type designation assigned by the SSD. The device was a 4-stage transistor amplifier with a dynamic microphone in which the original transistors were replaced by the more powerful models. By the end of 1955, seven or eight variations of the design had been carried out in order to improve the device mechanically and electronically. The work was of a trial-and-error nature and inmates of the prison did as little as possible to further the work.

2) In February 1956, large quantities of OC 70, OC 71, and OC 72 transistors, [redacted] were delivered to the camp. They arrived in their original boxes each containing 100 transistors. They may have been purchased [redacted] as the transistors were available there. East German transistors made at Teltow by Dr. Falter (fnu) had been tried but they were too large and not reliable. Russian transistors had also been tried but tests indicated they were not reliable and the voltage requirements (50 V) were too high for use in miniature work. 25X1 25X1 25X1

3) After delivery of the [redacted] transistors, construction of Type I device was begun. About 150 were produced but not all were completely equipped with transistors and microphones. Even now, many of the Type I devices may not be ready for operation because of lack of secondary components. Also, some of the prisoners working on the project have been released from the camp. 25X1

4) Models of the device had been tested. The testing took place in another department and no details are available. The technical data for Type I are contained in the explanation of the circuit diagram shown in Attachment A.

c. <u>Type II</u> (see Attachment B) was developed in a manner similar to that of Type I, from various handwritten circuit diagrams which had to be calculated and refined. The design for Type II was completed by March 1956, models were produced and tested, and the prisoners were put to work constructing the devices. Approximately 150 Type II devices were constructed but, like Type I, all may not be finished and ready for operation.

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d. Type III (see Attachment C) was a 3-stage transistor amplifier which represented a further development carried out on the basis of Types I and II. An undetermined number of OC 65 and OC 66 transistors arrived at the prison in April or May 1956, and by that time the theoretical design for Type III had been completed. Only one model of Type III had been made by August 1956.

e. At no time did the SSD personnel make any direct statement concerning the success or failure of the operation of the devices, whether they had been put into operation, or for what purposes they were used. Any of the three types can be tied into a telephone line to pick up conversations in the room, using the power from the telephone line to operate the device. The telephone line can be tapped at any point along its course and the conversation recorded on the machines. Testing the telephone line will detect the tap for monitoring the device but not the tie-in of the device to the line.

7. Minifons

a. P-55 Minifons with 4-hour spools were used as recorders. Play-back was made in conjunction with a 10 W amplifier and a loudspeaker. A secret project was underway at the camp to develop a method for remote control of a Minifon but no details of the project are known.

b. Minifon recorders had been modified to operate under water when attached to the hulls of ships. The microphone would allegedly be concealed on board. The number of recorders modified for this purpose is unknown.

c. One of the prisoners had been asked to produce a miniature recorder but when he requested equipment and supplies for this work he was refused and no work was accomplished.

8. Erasure of Recording Wire

One of the tasks at the camp was the construction of a device for rapid erasure of recording wire; this device was developed on the basis of a suggestion made by RTI Nuremberg for erasing magnetic tape. The erasure was effected by a fading alternating field. The inductance (L_1 or L_2) and capacitance (C) of a tank circuit were selected so that damped oscillations resulted. (See Attachment D). Two coils were arranged one above the other to form a pocket which held the wire spool. The wire could then be erased in a few seconds.

9. Other Audio-Surveillance Equipment

a. In January 1956, a prisoner was asked to develop a monitoring device which could record conversation over the noise of a radio. No literature on the subject was offered and the prisoner refused to undertake the project.

b. A 3-transistor amplifier had been built for insertion into a standard telephone condenser with connections as indicated in Attachments E and F. This unit would operate when the telephone was not in use. Approximately 15 of the devices were built.

[redacted] Comments: 25X1

[redacted]

4. Dr. Mathias Falter was previously reported as chief of development of transistors, rectifiers, and diodes at VEB Werk fuer Bauelement der Nachrichtentechnik (WBN) Carl von Ossietzky in Berlin-Teltow.

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Attachment A

EXPLANATION OF BASIC CIRCUIT DIAGRAM OF 4-STAGE TRANSISTOR AMPLIFIER WITH DYNAMIC MICROPHONE AND TELEPHONE LINE (TYPE I)

Key to Diagram

1. Dynamic microphone with alternating current resistance of 200 Ohms and 0.1 millivolt per microbar.
2. Shielded microphone cable (may be up to 50 meters in length).
3. Amplifying system with four stages.
4. Valvo transistor OC 70.
5. Valvo transistor OC 71.
6. Valvo transistor OC 71.
7. Valvo transistor OC 72.
8. Telephone line with alternating current resistance of 600 Ohms.
9. Power supply.
10. Connections for recording output of amplifier.

Technical Data

Frequency range: 150 to 9000 cycles ± 2 decibels.

External voltage interval: 55 decibels.

Effective output: +1 neper at 600 Ohms.

Noise factor: 3 percent.

Dimensions of the amplifying device: approximately 100 x 50 x 20 mm.

Attachment B

EXPLANATION OF BASIC CIRCUIT DIAGRAM OF 4-STAGE TRANSISTOR AMPLIFIER WITH CRYSTAL MICROPHONE AND TELEPHONE LINE (TYPE II)

Key to Diagram

1. Crystal microphone with alternating current resistance of 500 kilo Ohms. (The microphone is believed to be Type C 36

2. Shielded microphone cable with maximum length of 10 meters.
3. Amplifying system with four stages. Stages 1 and 2 are the receiver and stages 3 and 4 are the transmitter. The input impedance is approximately 500 kilo Ohms. The output impedance is approximately 600 Ohms.
4. Valvo transistor OC 70.
5. Valvo transistor OC 70.
6. Valvo transistor OC 71.
7. Valvo transistor OC 72.
8. Telephone line with an alternating current resistance of 600 Ohms.
9. Power supply.
10. Recording device.

Technical Data

Frequency range: 150 to 9000 cycles $\pm$ 2 decibels.

External voltage interval: 50 decibels.

Microphone: has a super elevation of approximately 30 decibels at between 1000 and 7000 cycles.

Effective output: +1 neper at 600 Ohms.

Noise factor: not known.

Dimensions of amplifying device: 100 x 50 x 20 mm.

Attachment C

EXPLANATION OF BASIC CIRCUIT DIAGRAM OF 3-STAGE TRANSISTOR AMPLIFIER WITH DYNAMIC MICROPHONE AND TELEPHONE LINE (TYPE III)

Key to Diagram

1. Dynamic microphone with alternating current resistance of 200-1000 Ohms and 0.1 millivolt per microbar.
2. Shielded microphone cable; maximum length 100 meters.
3. Amplifier: Stages 1 and 3 are the transmitter circuit. The input impedance is approximately 1 kilo Ohm.
4. Valvo transistor OC 65.
5. Valvo transistor OC 66.
6. Valvo transistor OC 66.
7. Telephone line with alternating current resistance of 600 Ohms.
8. Power supply.
9. Recording device.

Technical Data

Frequency range: 150 to 8000 cycles $\pm$ 2 decibels.

Effective output: 0 nepers at 600 Ohms.

Noise factor: not known.

External voltage interval: not known.

Dimensions: 60 x 40 x 20 mm.

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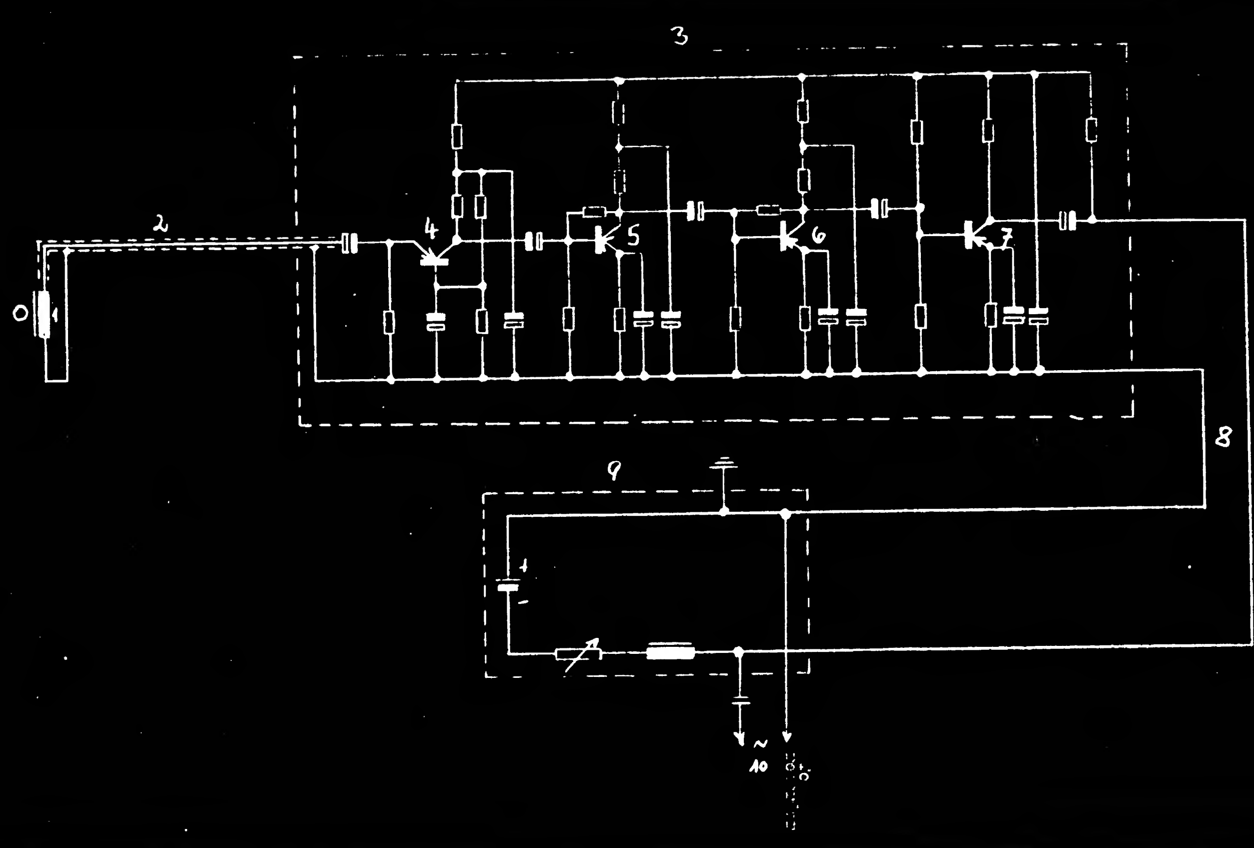

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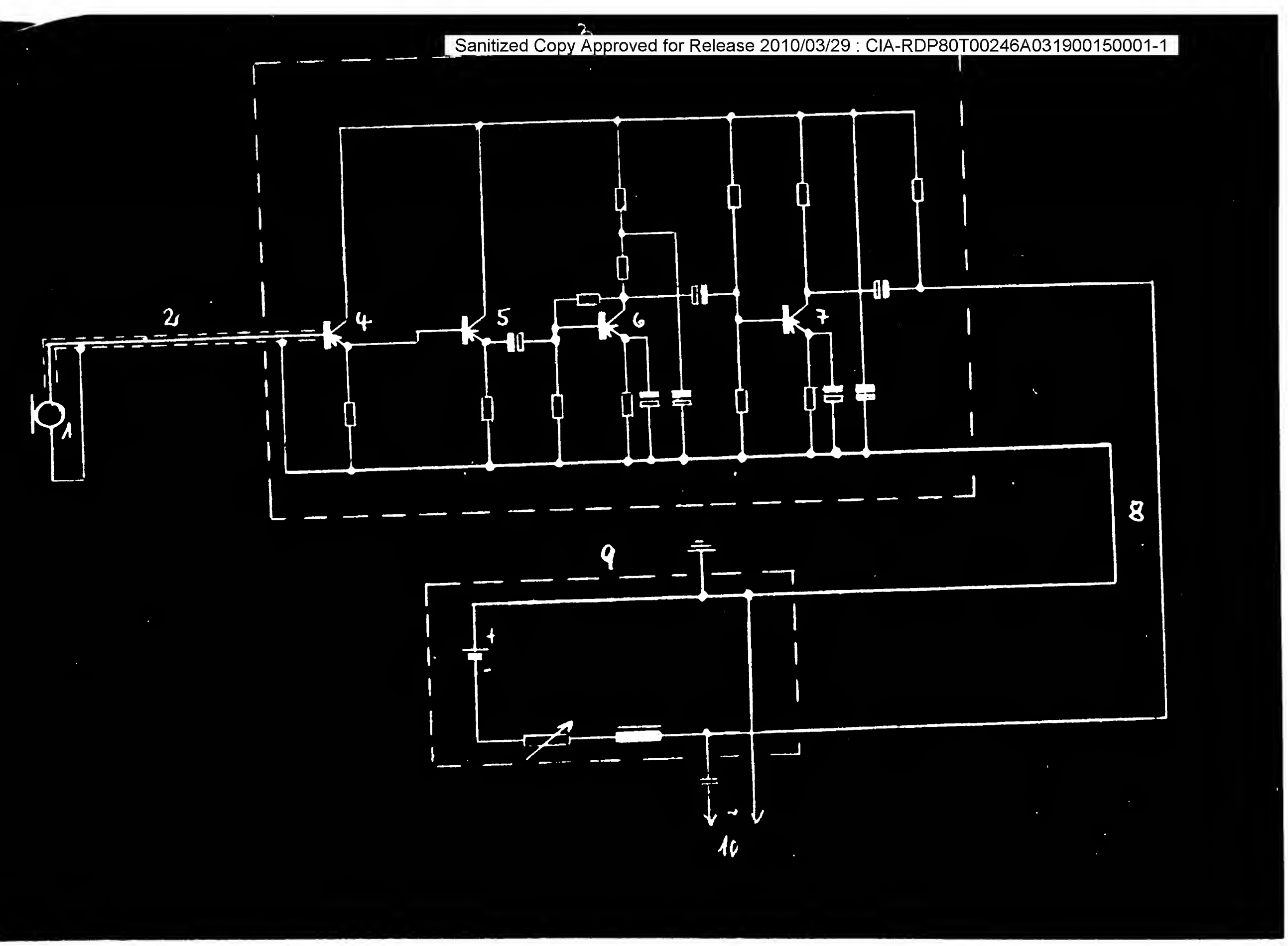

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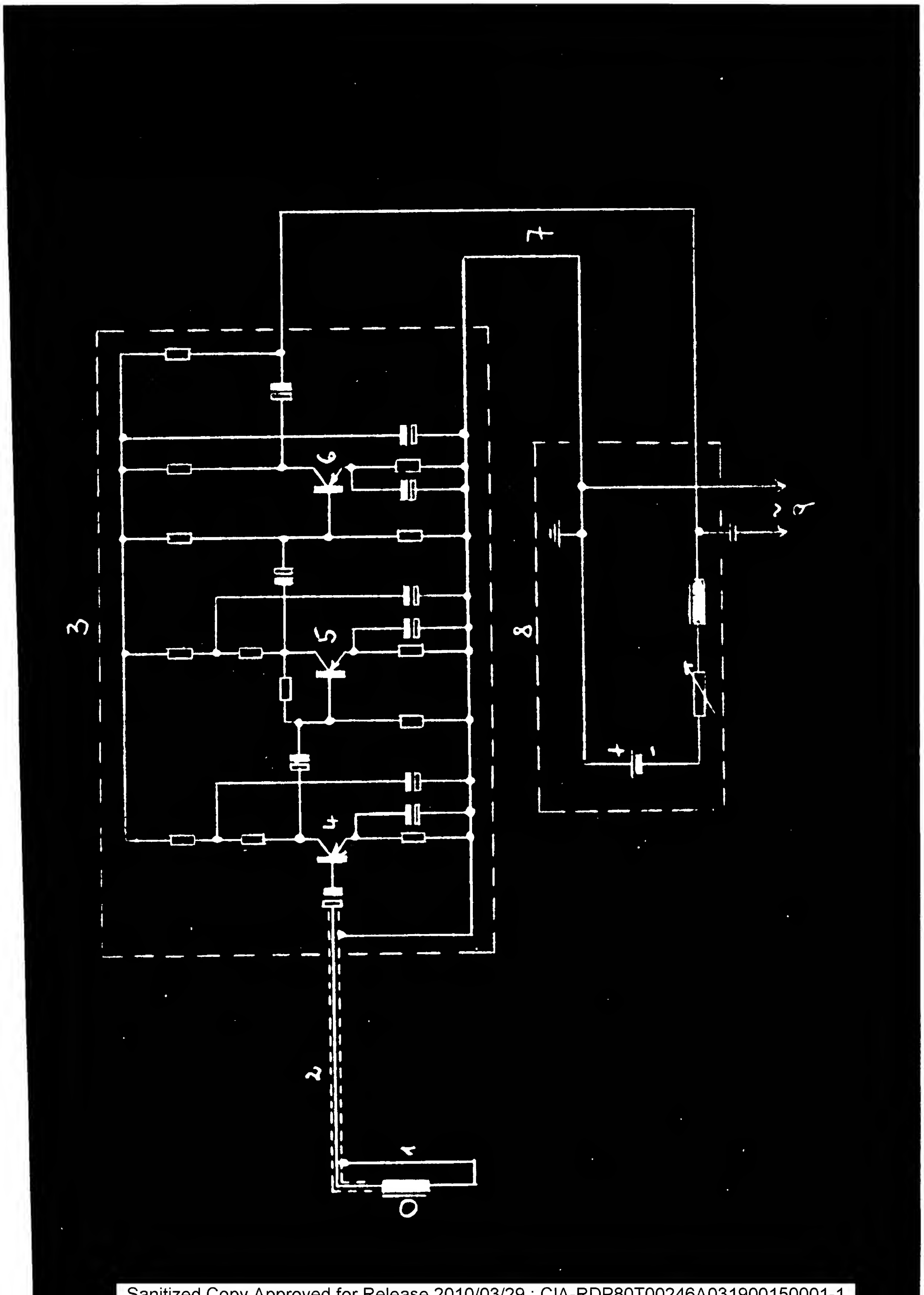

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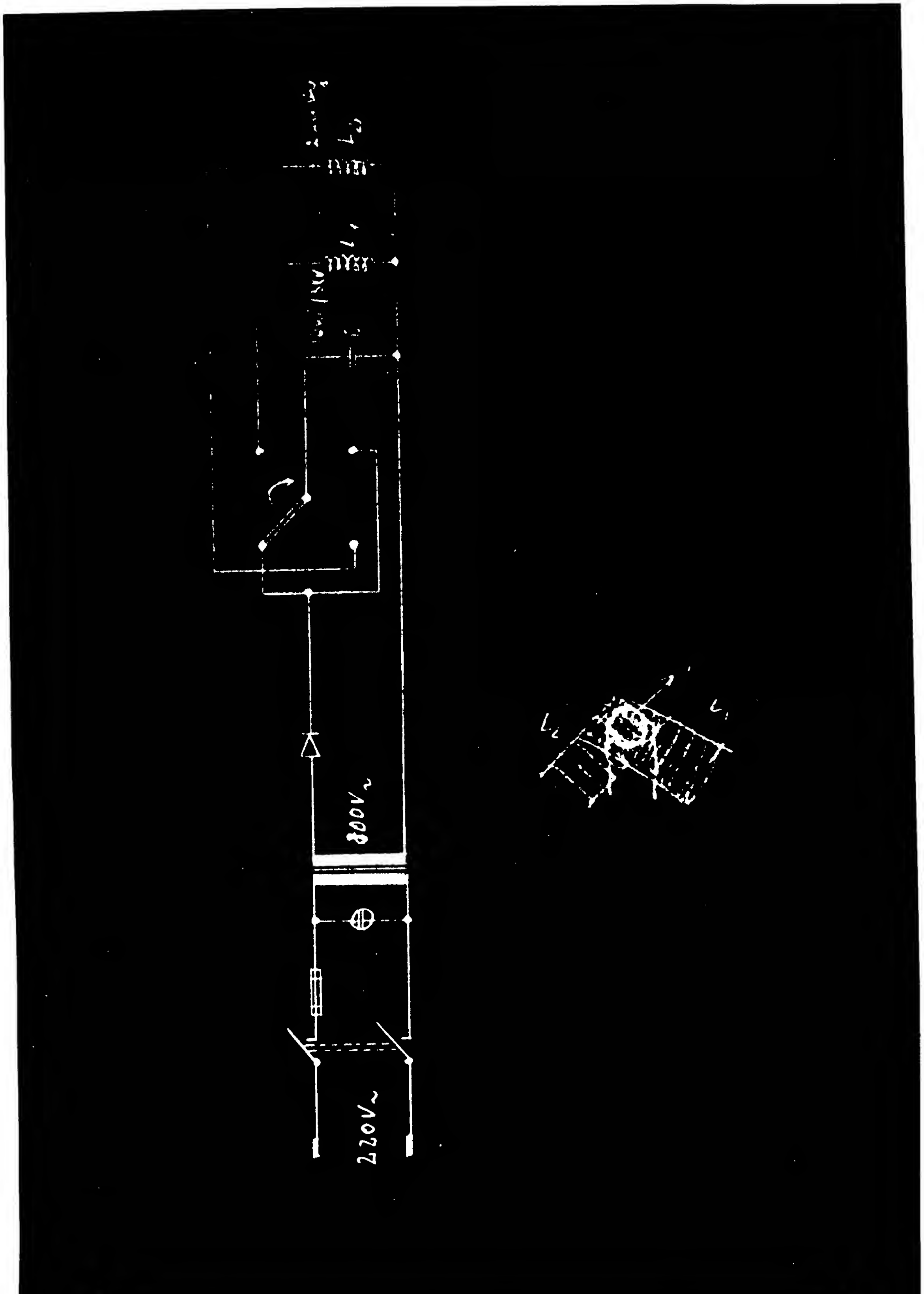

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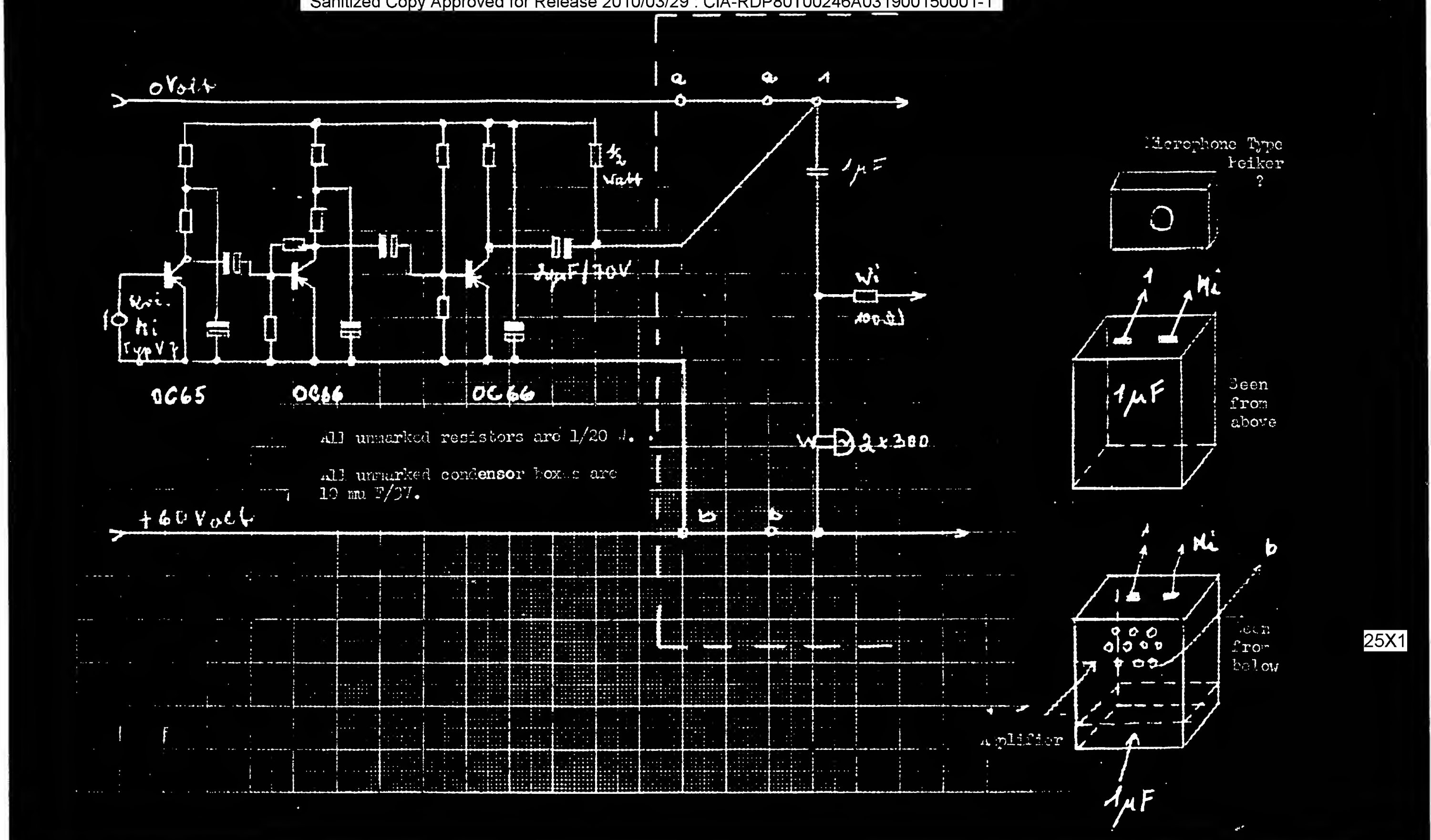

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TABLE TELEPHONE with ground and flicker signal calling 34

W 48

Ausgabe 1 2 3 4